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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

[MB Docket No. 21-422; FCC 21-117; FR ID 58894]

Updating FM Broadcast Radio Service Directional Antenna Performance Verification

AGENCY: Federal Communications Commission.

ACTION: Proposed rule.

SUMMARY: In this document, the Commission adopted a Notice of Proposed Rulemaking, in which it sought comment on proposals to change the rules governing verification of FM and Low Power FM (LPFM) directional antennas by broadcast station applicants. These specific rule changes were proposed based on a Petition for Rule Making filed by four antenna manufacturers and one broadcaster.

DATES: Comments may be filed on or before **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** and reply comments may be filed on or before **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You may submit comments, identified by MB Docket No. 21-422, by any of the following methods:

- *Electronic Filers*: Federal Communications Commission's Web Site: http://apps.fcc.gov/ecfs//. Follow the instructions for submitting comments.
- *Paper Filers*: Parties who choose to file by paper must file an original and one copy of each filing.

  Filings can be sent by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail (although the Commission continues to experience delays in receiving U.S. Postal Service mail). All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 45 L Street NE, Washington, DC 20554.

- Effective March 19, 2020, and until further notice, the Commission no longer accepts any hand or messenger delivered filings. This is a temporary measure taken to help protect the health and safety of individuals, and to mitigate the transmission of COVID-19.
- During the time the Commission's building is closed to the general public and until further notice, if more than one docket or rulemaking number appears in the caption of a proceeding, paper filers need not submit two additional copies for each additional docket or rulemaking number; an original and one copy are sufficient.

People with Disabilities: Contact the FCC to request reasonable accommodations (accessible format documents, sign language interpreters, CART, etc.) by e-mail: FCC504@fcc.gov or phone: 202-418-0530 or 202-418-0432 (TTY).

FOR FURTHER INFORMATION CONTACT: Albert Shuldiner, Chief, Media Bureau, Audio Division, (202) 418-2700; Thomas Nessinger, Senior Counsel, Media Bureau, Audio Division, (202) 418-2700. For additional information concerning the Paperwork Reduction Act (PRA) information collection requirements contained in this document, contact Cathy Williams at 202-418-2918, or via the Internet at Cathy.Williams@fcc.gov.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's Notice of Proposed Rulemaking (NPRM), MB Docket No. 21-422; FCC 21-117, adopted and released on November 15, 2021. The full text of this document is available for public inspection and copying via ECFS at http://apps.fcc.gov/ecfs and the FCC's website at https://docs.fcc.gov/public/attachments/FCC-21-117A1.pdf. Documents will be available electronically in ASCII, Microsoft Word, and/or Adobe Acrobat. Alternative formats are available for people with disabilities (Braille, large print, electronic files, audio format), by sending an email to fcc504@fcc.gov or calling the

Commission's Consumer and Governmental Affairs Bureau at (202) 418–0530 (voice), (202) 418–0432 (TTY).

Initial Paperwork Reduction Act of 1995 Analysis

The NPRM in document FCC 21-117 seeks comment on proposed rule amendments that may result in modified information collection requirements. If the Commission adopts any modified information collection requirements, the Commission will publish another notice in the *Federal Register* inviting the public to comment on the requirements, as required by the Paperwork Reduction Act, Public Law 104-13; 44 U.S.C. 3501-3520. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, the Commission seeks comment on how it might further reduce the information collection burden for small business concerns with fewer than 25 employees. Public Law 107-198; 44 U.S.C. 3506(c)(4).

Synopsis

1. Some broadcast stations use antennas that suppress the radiated field in certain directions and enhance it in others, known as directional antennas. Whether used by an AM, FM, Low Power FM (LPFM), or digital television (DTV) station, the goal is the same: to radiate more radiofrequency energy in some directions than others, in order to prevent interference to other broadcast stations, or to prevent the signal from radiating outside the station's authorized service area.

2. The Commission's rules require that upon completion of the construction of a broadcast antenna system, a showing is required to demonstrate that the facility is operating in compliance with its construction permit in order to be licensed. Joint Petitioners cite specifically to the Commission's rules regarding FM and TV directional station licensing, particularly 47 CFR 73.316 and 73.685, respectively. They note that since the Commission adopted these rules in 1963, and continuing through almost 60 years' worth of amendments, the major difference between the FM and TV rules is that § 73.316 requires an applicant for a license to cover a construction permit specifying an FM directional antenna system to provide a "tabulation of the

measured relative field pattern" set forth in the construction permit, while 47 CFR 73.685 requires only a "tabulation of the relative field pattern" of a TV directional antenna without requiring that the pattern be "measured."

3. In order to provide permittees with the measurements that 47 CFR 73.316(c)(2)(iii) requires to verify the performance of a directional FM broadcast antenna, directional antenna manufacturers may mount a full-scale model of the antenna or some elements of it on a test range, which is a large open area maintained by the antenna manufacturer (in most cases) for such testing, with pre-positioned testing probes for measuring signal strength in the far field of the antenna pattern. Such a re-creation of the antenna includes replicating the tower or pole on which the antenna is to be mounted, and may also include replicating any structures on or near the ultimate site of the antenna, as such structures can affect the antenna's radiation pattern in specific ways. The other common method is to construct a smaller, scale model of the antenna, mounting structure, and nearby structures, and to take measurements of the signal generated by the scale model in an indoor anechoic (non-reflecting) chamber.

4. Joint Petitioners point out these methods for measuring FM directional antenna patterns greatly increase expenses for broadcasters and potentially lead to inaccurate results. Broadcasters bear the expense of physically re-creating the environment in which the directional FM antenna is to be installed, including occasionally needing to create single-use components to duplicate non-standard mounting structures. The Joint Petitioners additionally note it is difficult to produce accurate mechanical and, thus, electrical alignment of the test range. Any mis-alignments can cause deviations of the test range from the idealized perfectly aligned range, and can lead to inaccurate test results. According to Joint Petitioners, computerized models can reduce or eliminate these mechanical errors.

5. Joint Petitioners note other instances in which the Commission has allowed the use of computer modeling to demonstrate compliance with the rules. For example, the Commission in 2008 allowed AM broadcasters using series-fed radiators in their directional

antenna arrays to replace measured proofs of performance of their directional antenna systems with computer models using the "method of moments" system, based on the Numerical Electromagnetics Code (NEC) moment method of analysis developed at the Lawrence Livermore Laboratory, Livermore, California. The Commission allowed applicants for certain AM directional stations to use method of moments computer modeling to demonstrate the performance of their directional antenna arrays.

6. Joint Petitioners thus argue that the time is ripe for the Commission to update its rules to allow computer modeling, at the applicant's option, in lieu of physical modeling and measurement when verifying FM directional antenna performance. In further support of their argument, Joint Petitioners include results of a sample study of an actual directional FM station, comparing results of a computer-modeled directional pattern proof to a previous scale-model physical measurement of performance of that station's directional antenna. The comparison showed close correlation between the results of the physical model measurements and those predicted by the computer model. Although Joint Petitioners further maintain that there should be no need, based on current rules, to establish the qualifications of the antenna design engineer(s) (as opposed to the engineer(s) supervising antenna installation, as required in 47 CFR 73.316(c)(2)(vii)), Joint Petitioners' proposed amendment to § 73.316 includes a requirement identifying and describing the software tools and procedures used in designing the antenna, and setting forth the qualifications of the engineer(s) who designed the antenna, who performed the modeling, and who prepared the instructions for mounting of the antenna at the site. By including this information, Commission staff would be able to evaluate the methods used and, presumably, the accuracy of the computer-modeled verification of the directional pattern.

7. The Commission tentatively concluded that requiring FM and LPFM applicants to provide physical measurements as the only means to verify directional antenna patterns is outdated. This restriction places such applicants on an unequal footing with their AM and DTV counterparts. The Commission therefore seeks comment on whether it should adopt Joint

Petitioners' proposed rule amendments, attached hereto as Appendix A, to give applicants proposing directional FM and LPFM facilities the option of using computer modeling for pattern verification. As discussed below, it solicits commenter input on Joint Petitioners' proposed rule amendments, as well as any concerns about whether computer modeling, without any physical confirmation, will provide sufficient assurance that an applicant's FM directional antenna will perform in the field as predicted in the model.

8. The Commission believes that the proposed rule change would provide regulatory parity and ongoing relief for both antenna manufacturers and FM broadcasters while maintaining the integrity of its licensing requirements. Commission records indicate that over 2,000 full-service FM broadcast stations, 21.5% of such stations, use directional antennas. Our records also indicate that 10 LPFM stations, 0.5% of the total, use directional antennas. The proposed rule change would allow any of those stations that replace existing antennas to avoid the expense of field measurements. Additionally, given the ongoing demand for FM spectrum and the need for new stations to avoid interference to existing broadcasters, the Commission anticipates an increase in the use of directional antennas. It believes those future broadcast applicants would benefit from this proposal. Petitioners assert that the requirements of 47 CFR 73.316(c)(2) can require sometimes substantial expenditures of time and money to such applicants. The Commission agreed with the Joint Petitioners that when § 73.316 was first added to the rules over five decades ago, the computer tools enabling design and modeling of directional antennas did not exist. As the Joint Petitioners point out, broadcasters and the Commission now can take advantage of the newly developed modeling tools. The Commission seeks comment on whether use of these tools will increase the risk of interference to adjacent stations. Finally, adopting the proposed rule change would align § 73.316 with the rules regarding AM and TV directional station licensing. The Commission seeks comment on these issues.

9. *Correlating physical measurements*. The Commission seeks comment on whether it should require any physical measurement in addition to computer modeling. Historically it has

been rare for the Media Bureau to receive complaints from stations about interference attributable to directional FM broadcast stations. Is this because manufacturing standards are so high that the risk of incorrect directional patterns is minimized? Or has § 73.316 forced manufacturers and broadcasters to take extra and necessary steps to minimize risk? The Commission seeks input on whether computer modeling by itself is sufficient or whether some reduced level of field measurement is still necessary. Is there a less resource intensive and costly level of field verification that would enhance the reliability of computer modeling? Although Joint Petitioners point to the method of moments modeling of AM directional systems in support of their proposal, the AM directional procedures do not rely solely on computer modeling, but rather such modeling must be verified by correlation with monitored antenna sample indications. *See* 47 CFR 73.151(c)(1), (c)(2)(ii). Thus, in the case of AM directional arrays, proper adjustment of the antenna pattern is determined by comparing the method of moments computer model with measurements taken of the antenna array. Joint Petitioners' proposed rule changes do not propose any such measured parameters for pattern verification. The Commission seeks comment as to whether there are physical measurements that should be taken from an installed FM directional antenna that can similarly be correlated with the computer model of that antenna, in order to verify adjustment of the antenna pattern.

10. *Directional FM antenna modeling software*. The Commission also seeks input on whether it should adopt a specific computer program or underlying model for directional FM antenna verification. Joint Petitioners state that there currently exist "several software programs that can be used for modeling antennas as well as environmental objects in proximity to the antennas, plus filters, transmission lines, hybrids, lumped constant RF components, and so on." Is there a common program or model that antenna manufacturers and/or broadcast engineers agree provides the greatest accuracy? For example, the method of moments is the accepted method for modeling AM directional antenna arrays. Is there a similarly accepted method for modeling directional FM antennas? Is any other local, state, or Federal Government agency

currently using a model that would be suitable for this purpose? Similarly, are there suitable models currently in use outside the United States? Is there a voluntary consensus standard for modeling directional FM antennas and, if so, is there any reason use of such a standard would be impractical or otherwise unsuitable? If there is a voluntary consensus standard for directional FM antennal verification, commenters should discuss the process by which the standard was developed with reference to openness of the process to a broad and balanced range of stakeholders, transparency of the process, due process considerations (e.g., notice of meetings), any appeals process, and consensus procedures. Commenters should also state whether any voluntary consensus standard is an international standard. Additionally, 47 CFR 2.1093(d)(2) by its terms requires "adequate documentation" demonstrating full validation of the numerical method used in the computer software for evaluating compliance with limits on specific absorption rates of radiofrequency energy, and further requires that the equipment used must be modeled under FCC-accepted standards or procedures. Should a similar provision be included in any amendment to § 73.316? Commenters should discuss the extent to which any amendment of our rules based on computer models would establish performance rather than design criteria, as well as the ability of small and medium-size enterprises to use and benefit from using an approved or designated computer model.

11. Assuming that there is no single voluntary consensus standard as to FM directional modeling software, the Commission invites comment on what computer modeling software it should accept from applicants to verify FM directional antenna patterns. It asks, for example, whether verification should be limited to the computer modeling software used by the various antenna manufacturers in evaluating their products. Do these programs have a common theoretical basis, such that results generated by manufacturers' in-house software programs should be accepted as accurate? Alternatively, should we accept results from other software products created by engineering consultants or other third-party vendors that are commonly used in the industry to verify FM directional antenna patterns? Do such third-party software products

also share a common theoretical basis with each other and with antenna manufacturers' software, such that all may be relied upon to the same degree? Are commenters aware of significant differences among the results of the prediction models generated by the several software programs available, indicating that some are more accurate than others? Commenters are also asked to address whether we should accept results from modeling software written by an individual engineer or broadcaster for a specific antenna, and if so what showings, if any, must be made to vouch for the accuracy of such software?

12. In the event that commenters believe we should accept computer-modeled FM pattern verifications, no matter what models or software are used, the Commission asks that they address how the staff should evaluate the directional antenna models used and how any model will incorporate advances in technology. While the Joint Petitioners' proposed rules require submission of a detailed description of the software tools and procedures being used and the qualifications of the engineer(s) constructing the computer models, given the number of such software programs, the Commission asks commenters to discuss how Commission staff should accept or confirm the accuracy of such models. Are there specific types of antenna installations where measurements should still be required (for example, installations on the sides of buildings)? What information regarding submitted computer models should be provided in license applications? Should that information be greater or less than that proposed by Joint Petitioners? To what extent will the Commission staff be able to use any recommended computer model to confirm or replicate the results submitted by applicants?

13. Additionally, in discussing the software proposed to be used in modeling FM directional antenna patterns, the Commission asks commenters specifically to enumerate the costs and benefits of the proposed software and any alternatives proposed by commenters. This should include the costs to license any software needed to run an approved or designated computer model, and the distribution of costs and benefits among stakeholders. To the extent possible, commenters should also quantify projected costs and benefits, identify supporting

evidence and any underlying assumptions, and explain any difficulties faced in trying to quantify benefits and costs of the proposals and how the Commission might nonetheless evaluate them.

14. *Interference complaints*. The Commission seeks comment on whether our existing policies are sufficient to resolve any interference complaints or disputes pertaining to the directional FM antennas. *See* 47 CFR 73.209, 73.211. Are new or modified rules necessary to address such complaints or disputes? Should the burden of proof fall on the applicant providing verification of antenna pattern performance via computer modeling, or on the complaining party? Should the burden shift if the operator of the FM directional station provided measurements as opposed to solely computer model data? What level of proof is needed to overcome a complaint that a directional FM antenna is not performing as predicted? Duplication or scale modeling of the installed antenna for purposes of measurement to overcome an accusation of faulty pattern performance would involve considerable expense. What safeguards, if any, are needed to prevent frivolous complaints of inaccurate FM directional pattern performance?

15. *Experience with computer modeling of directional FM antennas*. Perhaps most importantly, the Commission is interested in comments from broadcasters, engineers, and manufacturers who have used both computer modeling of FM directional antennas and physical models of the same, and who can discuss their experience regarding the accuracy of computer-modeled antennas vis-à-vis the performance of such antennas as installed. Based on such experience, are commenters confident that computer modeling can take the place of physical measurements of FM directional antennas or scale models of such antennas? Are there specific procedures that in commenters' experience would affect the accuracy of such computer models, in either a positive or negative manner? Are there particular difficulties in simulating certain environments in which a computer-modeled FM directional antenna is to be installed that would argue against use of computer modeling in those situations, and are there ways in which those difficulties can be minimized or overcome? Again, are there measurable attributes of an installed FM directional antenna that can be used to confirm the accuracy of a computer-

generated model of the antenna's pattern without performing field measurements? The Commission invites comment on these and any other issues relevant to this proposal to update its FM directional antenna rules.

16. *Digital Equity and Inclusion.* Finally, the Commission, as part of its continuing effort to advance digital equity for all, including people of color, persons with disabilities, persons who live in rural or Tribal areas, and others who are or have been historically underserved, marginalized, or adversely affected by persistent poverty or inequality, invites comment on any equity-related considerations and benefits (if any) that may be associated with the proposals and issues discussed herein. The term "equity" is used here consistent with Executive Order 13985 as the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment.[1] See Exec. Order No. 13985, 86 FR 7009, Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (January 20, 2021). Section 1 of the Communications Act of 1934 as amended provides that the FCC "regulat[es] interstate and foreign commerce in communication by wire and radio so as to make [such service] available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex." 47 U.S.C. 151. Specifically, it seeks comment on how its proposals may promote or inhibit advances in diversity, equity, inclusion, and accessibility, as well the scope of the Commission's relevant legal authority.

PROCEDURAL MATTERS

Ex Parte Rules.

17. The proceeding this NPRM initiates shall be treated as a "permit-but-disclose"

[1] Such individuals include Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

proceeding in accordance with the Commission's ex parte rules, 47 CFR 1.1200 et seq. Persons making ex parte presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral ex parte presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the ex parte presentation was made, and (2) summarize all data presented and arguments made during the presentation. Memoranda must contain a summary of the substance of the ex parte presentation and not merely a listing of the subjects discussed. More than a one or two sentence description of the views and arguments presented is generally required. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during ex parte meetings are deemed to be written ex parte presentations and must be filed consistent with 47 CFR 1.1206(b). In proceedings governed by 47 CFR 1.49(f) or for which the Commission has made available a method of electronic filing, written ex parte presentations and memoranda summarizing oral ex parte presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable.pdf). Participants in this proceeding should familiarize themselves with the Commission's ex parte rules.

Initial Regulatory Flexibility Analysis.

18. The Regulatory Flexibility Act of 1980, as amended (RFA), requires that a regulatory flexibility analysis be prepared for notice and comment rule making proceedings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic

impact on a substantial number of small entities." The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction." In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act. A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).

19. As required by the Regulatory Flexibility Act of 1980, as amended (RFA), the Commission has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies proposed in the Notice of Proposed Rulemaking (NPRM). Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the NPRM provided on the first page of the *NPRM*. The Commission will send a copy of this entire NPRM, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA). In addition, the NPRM and the IRFA (or summaries thereof) will be published in the Federal Register.

A. Need For, and Objectives of, the Proposed Rules.

20. The Commission initiates this rulemaking proceeding to obtain comments regarding its proposal to allow an applicant for an FM broadcast station utilizing a directional antenna to verify the antenna's directional pattern through the use of computer modeling, rather than physical modeling and measurements. An applicant for a directional FM station currently must verify the accuracy of the directional pattern by way of measurements, which are made either on a full-scale replica of the antenna on a test range, or on a scale model of the antenna in an anechoic chamber. In either case the model must include elements replicating the environment of the antenna as it is to be installed, including the support structure, transmission lines, other nearby antennas, or other structures that could affect the directional pattern. The

NPRM proposes to give applicants proposing directional FM facilities the option, in lieu of such physical models and measurements, to verify antenna pattern performance via computer modeling, which is less expensive and able to be adjusted to account for conditions in the installed environment.

B. Legal Basis.

21. The proposed action is authorized pursuant to sections 1, 4(i), 4(j), 301, 303, 307, 308, 309, 316, and 319 of the Communications Act, 47 U.S.C. 151, 154(i), 154(j), 301, 303, 307, 308, 309, 316, 319.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply.

22. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted. 5 U.S.C. 603(b)(3). The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction." 5 U.S.C. 601(6). In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act. A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA. The rules proposed herein will directly affect small television and radio broadcast stations. Below, we provide a description of these small entities, as well as an estimate of the number of such small entities, where feasible.

23. *Radio Stations*. This Economic Census category "comprises establishments primarily engaged in broadcasting aural programs by radio to the public." The SBA has created the following small business size standard for this category: those having $41.5 million or less in annual receipts. Census data for 2012 show that 2,849 firms in this category operated in that year. Of this number, 2,806 firms had annual receipts of less than $25 million, and 43 firms had

annual receipts of $25 million or more. Because the Census has no additional classifications that could serve as a basis for determining the number of stations whose receipts exceeded $41.5 million in that year, we conclude that the majority of radio broadcast stations were small entities under the applicable SBA size standard.

24. Apart from the U.S. Census, the Commission has estimated the number of licensed commercial FM radio stations to be 6,682, the number of licensed FM translator and booster stations to be 8,771, and the number of licensed LPFM stations to be 2,081, for a total number of 17,534. As of July 2021, 6,676 of 6,677 FM stations had revenues of $41.5 million or less, according to Commission staff review of the BIA Kelsey Inc. Media Access Pro Database (BIA). In addition, the Commission has estimated the number of noncommercial educational (NCE) FM radio stations to be 4,214. NCE stations are non-profit, and therefore considered to be small entities. Therefore, we estimate that the majority of full-service FM broadcast stations are small entities.

D. Description of Projected Reporting, Recordkeeping and Other Compliance Requirements.

25. The NPRM proposes to amend existing rules to provide more flexibility and reduce expenses to applicants for FM broadcast stations proposing directional antenna patterns. The proposed revisions require additional paperwork obligations for those applicants opting to use computer modeling rather than the currently accepted physical measurements to verify FM directional patterns.

E. Steps Taken to Minimize Significant Impact on Small Entities, and Significant Alternatives Considered.

26. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification,

consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.

27. In the NPRM, the Commission proposes to amend existing rules to allow the same computer modeling for proposed FM directional antennas that is allowed for verifying directional antenna patterns in the AM and TV/DTV services. The proposed rules will eliminate the requirement that applicants provide measured tabulations of FM directional antenna patterns, and allow them to verify FM directional antenna patterns by use of computer models. These revisions will reduce the expense to station applicants of having to create physical models of FM directional antennas and their environs in order to make the measurements required by the current rules. The proposed rule amendments will therefore reduce costs to these FM applicants and will reduce the amount of time needed to construct and install directional FM antennas.

28. Alternatives considered by the Commission include retaining the existing rules, and requiring measurement of certain antenna parameters to assist in verification of FM directional antenna coverage patterns if the applicant uses computer modeling. The Commission seeks comment on the effect of the proposed rule changes on all affected entities. The Commission is open to consideration of alternatives to the proposals under consideration, including but not limited to alternatives that will minimize the burden on broadcasters, most of which are small businesses.

F. Federal Rules Which Duplicate, Overlap, or Conflict With, the Commission's Proposals.

29. None.

ORDERING CLAUSES

30. Accordingly, IT IS ORDERED that, pursuant to the authority contained in sections 1, 4(i), 4(j), 301, 303, 307, 308, 309, 316, and 319 of the Communications Act of 1934, as amended, 47 U.S.C. 151, 154(i), 154(j), 301, 303, 307, 308, 309, 316, and 319, this Notice of

Proposed Rulemaking IS ADOPTED.

31. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Notice of Proposed Rulemaking, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

List of Subjects in 47 CFR Part 73

Radio, Reporting and recordkeeping requirements.

FEDERAL COMMUNICATIONS COMMISSION

Marlene Dortch,

Secretary,

Office of the Secretary.

Proposed Rules

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR part 73 as follows:

PART 73 - RADIO BROADCAST SERVICES

1. The authority citation for part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 155, 301, 303, 307, 309, 310, 334, 336, 339.

2. Amend § 73.316 by revising paragraph (c)(2)(iii), redesignating paragraphs (c)(2)(iv) through (ix) as paragraphs (c)(2)(v) through (x), and adding new paragraph (c)(2)(iv) to read as follows:

§ 73.316 FM antenna systems.

* * * * *

(c) * * *

(2) * * *

(iii) A tabulation of the measured or computer modeled relative field pattern required in paragraph (c)(1) of this section. The tabulation must use the same zero degree reference as the plotted pattern, and must contain values for at least every 10 degrees. Sufficient vertical patterns to indicate clearly the radiation characteristics of the antenna above and below the horizontal plane. Complete information and patterns must be provided for angles of −10 deg. from the horizontal plane and sufficient additional information must be included on that portion of the pattern lying between + 10 deg. and the zenith and −10 deg. and the nadir, to conclusively demonstrate the absence of undesirable lobes in these areas. The vertical plane pattern must be plotted on rectangular coordinate paper with reference to the horizontal plane. In the case of a composite antenna composed of two or more individual antennas, the composite antenna pattern should be used, and not the pattern for each of the individual antennas.

(iv) When a directional antenna is computer modeled, as permitted in paragraphs (c)(2)(iii) and (x) of this section and in §73.1690(c)(2), a statement from the engineer(s) responsible for

designing the antenna, performing the modeling, and preparing the manufacturer's instructions for installation of the antenna, that identifies and describes the software tool(s) used in the modeling, the procedures applied in using the software, and lists such engineers' qualifications. Such computer modeling shall include modeling of the antenna mounted on a tower or tower section, and the tower or tower section model must include transmission lines, ladders, conduits, other antennas, and any other installations that may affect the computer modeled directional pattern.

* * * * *

3. Amend § 73.1620 by revising paragraph (a)(3) to read as follows:

§ 73.1620 Program tests.

(a) * * *

(3) FM licensees replacing a directional antenna pursuant to §73.1690 (c)(2) without changes which require a construction permit (*see* §73.1690(b)) may immediately commence program test operations with the new antenna at one half (50%) of the authorized ERP upon installation. If the directional antenna replacement is an EXACT duplicate of the antenna being replaced (*i.e.*, same manufacturer, antenna model number, and measured or computer modeled composite pattern), program tests may commence with the new antenna at the full authorized power upon installation. The licensee must file a modification of license application on FCC Form 302-FM within 10 days of commencing operations with the newly installed antenna, and the license application must contain all of the exhibits required by §73.1690(c)(2). After review of the modification-of-license application to cover the antenna change, the Commission will issue a letter notifying the applicant whether program test operation at the full authorized power has been approved for the replacement directional antenna.

* * * * *

4. Amend § 73.1690 by revising paragraph (c)(2) to read as follows:

§ 73.1690 Modification of transmission systems.

* * * * *

(c) * * *

(2) Replacement of a directional FM antenna, where the measured or computer modeled composite directional antenna pattern does not exceed the licensed composite directional pattern at any azimuth, where no change in effective radiated power will result, and where compliance with the principal coverage requirements of §73.315(a) will be maintained by the measured or computer modeled directional pattern. The antenna must be mounted not more than 2 meters above or 4 meters below the authorized values. The modification of license application on Form 302-FM to cover the antenna replacement must contain all of the data in the following sections (i) through (v). Program test operations at one half (50%) power may commence immediately upon installation pursuant to §73.1620(a)(3). However, if the replacement directional antenna is an exact replacement (*i.e.*, no change in manufacturer, antenna model number, AND measured or computer modeled composite antenna pattern), program test operations may commence immediately upon installation at the full authorized power.

(i) A measured or computer modeled directional antenna pattern and tabulation on the antenna manufacturer's letterhead showing both the horizontally and vertically polarized radiation components and demonstrating that neither of the components exceeds the authorized composite antenna pattern along any azimuth.

(ii) Contour protection stations authorized pursuant to §73.215 or 73.509 must attach a showing that the RMS (root mean square) of the composite measured or computer modeled directional antenna pattern is 85% or more of the RMS of the authorized composite antenna pattern. *See* §73.316(c)(9). If this requirement cannot be met, the licensee may include new relative field values with the license application to reduce the authorized composite antenna pattern so as to bring the measured or computer modeled composite antenna pattern into compliance with the 85 percent requirement.

(iii) A description from the manufacturer as to the procedures used to measure or computer

model the directional antenna pattern. The antenna measurements or computer modeling must be performed with the antenna mounted on a tower, tower section, or scale model equivalent to that on which the antenna will be permanently mounted, and the tower or tower section must include transmission lines, ladders, conduits, other antennas, and any other installations which may affect the measured or computer modeled directional pattern. See §73.316(c)(2)(iv) for details of the showings required in connection with an application filed for a station utilizing an FM directional antenna.

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